



FACT SHEET



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UNMANNED AERIAL VEHICLE BOOST PHASE INTERCEPT PROGRAM

INTRODUCTION

Rapidly emerging ballistic missile capability in Third World and marginally stable countries is an expanding threat to both the United States and its allies. As ballistic missiles proliferate, the probability that U.S. forces will have to be defended against theater ballistic missiles (TBMs) grows dramatically. The problem is worsened by the potential proliferation of TBMs containing chemical, biological or nuclear weapons of mass destruction.

BOOST PHASE INTERCEPT

Boost Phase Intercept (BPI) is the destruction of a ballistic missile shortly after launch and prior to the burnout of its rocket motor. All ballistic missiles, regardless of their size or range, are most vulnerable during the first minute or two after they are launched. During this phase of flight, they are large, slow-moving, and have very bright exhaust gases that are easy to detect and track using infrared sensors or even spotted with the naked eye.

During the Gulf War, many U.S. fighter pilots spotted the SCUD missiles during their boost phase, but without adequate weaponry, were unable to do anything. The vulnerability of ballistic missiles during their boost phase makes the job of targeting and destroying theater ballistic missiles (TBMs) much easier than trying to find and destroy their mobile transporter-erector launchers (TELs).

The Department of Defense (DoD) BPI programs will allow U.S. forces to take advantage of these ballistic missile

vulnerabilities to destroy TBMs. Boost-phase interception will permit our forces to destroy TBMs while they are still within enemy territory, potentially causing the post-intercept debris and their lethal payloads to fall within the aggressor's territory. Finally, BPI minimizes the utility of enemy countermeasures and decoys because the interception takes place before these defenses have a chance to deploy.

BPI complements terminal defense systems (PAC-3, THAAD, Navy Area Defense) by acting as a first active tier of missile defense. This prevents terminal defense saturation and will allow the terminal defenses to better discriminate and engage fewer incoming threats while they are in their final phase of flight before impact.

There are three BPI concepts being considered for future acquisition; the Air Force's Airborne Laser (ABL) Program; Space Based Laser (SBL); and Unmanned Aerial Vehicle (UAV). The ABL, a 747-based directed energy

weapon which passed a Milestone I decision in 1996, is the lead DoD BPI program. A second BPI weapon is the directed energy SBL. The third option is UAV BPI, a kinetic energy weapon concept viewed as a possible hedge or complement to the ABL program.

Advantages of BPI

- **Launch Zone Coverage Defends Multiple Threat Regions Simultaneously**
- **Mitigates Problem Of Falling Debris From Terminal Intercepts**
- **Deters Use of Lethal Payload Through Threat Of In-Country Debris Impact**
- **Provides Additional Tier For Leakage Reduction**
- **Defense / Hedge Against Terminal Countermeasures**
- **Defense/Hedge Against Advanced Submunitions**
- **Prevents Saturation Of Terminal Tier**

UAV BPI PROGRAM OVERVIEW

The UAV BPI program is currently focused on a cooperative (joint U.S.-Israel effort) risk mitigation of key subsystem technologies. A 1995-1996 Air Force analysis of alternatives study identified UAV BPI as the most cost-effective alternative to ABL. The U.S.-Israeli cooperative UAV BPI program is executed by the Ballistic Missile Defense Organization (BMDO) Technology Operations Deputate.

UAV BPI PROGRAM OVERVIEW [CONTINUED]

UAV BPI is an overflight weapon concept which employs coordinated constellations of armed UAVs in the vicinity of suspected theater ballistic missile (TBM) launch zones identified by intelligence efforts. The high altitude, long endurance UAVs would operate out of remote theater bases and loiter over the enemy territory to provide continuous launch zone coverage. The UAV systems utilize a combination of high altitude flight, special aircraft signature features, electronic countermeasures, and maneuver tactics to survive anticipated attacks by enemy air defense systems.

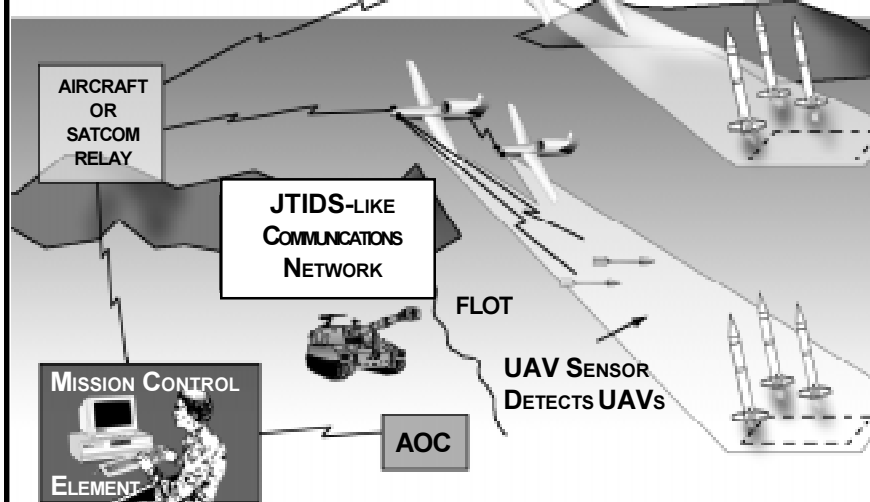
Each UAV is planned to carry several air launched, high speed interceptors and a suite of detection, track and fire control sensors. Positive identification of the TBM would be established by the UAV sensors prior to the launch of an interceptor to prevent any chance of fratricide. The concept also includes a ground-based mission control element which continuously monitors and adapts UAV BPI operations to the warfighting situation.

During a typical engagement, the interceptors are launched from the UAV shortly after the enemy TBM is detected to destroy it during the boost phase with either an exploding warhead or "hit-to-kill" impact. The exploding warhead produces many high speed fragments which impact and destroy the TBM booster motor, while a "hit-to-kill" intercept consists of a direct high momentum impact of the TBM with the entire interceptor mass. The "hit-to-kill" interceptor demands pinpoint accuracy and a very sophisticated guidance and control system.

The UAV BPI concept has particular benefit in its flexible employment, responsiveness to enemy threat, and its ability to cover threats launched from

NATIONAL FORCE STRUCTURE

- 75 UAVs (3 SQUADRONS)
- 1200 INTERCEPTORS
- 4 GROUND STATIONS (3 SQUADRONS + RESERVES)
- IOC: ~ 2005, FOC: 2006-2007
- 2-4 UAV LAUNCH ZONE CONSTELLATIONS
- 3-6 INTERCEPTORS PER UAV



AOC: Air Operations Center
FLOT: Forward Line of Troops
FOC: Full Operational Capability
IOC: Initial Operational Capability
JTIDS: Joint Tactical Information Distribution System
SATCOM: Satellite Communications

CONCEPT DESCRIPTION

- Overfly Enemy Launch Zones
- Intercept Ranges: 50-200 km
- UAV Loiter At 60-65 Kft
- 3-6 Interceptors per UAV
- 2-3 km/s Interceptor

CONCLUSION

Boost phase intercept of enemy TBMs is an important element of the Theater Missile Defense (TMD) architecture. As the first active tier of the TMD system, BPI weapons offer protection of large areas which may be reached by TBMs from a given launch area. The ability of BPI systems to defeat weapons of mass destruction and cause any hazardous debris to fall back in enemy territory offers a strong deterrent against enemy use of such weapons. The Cooperative U.S.-Israeli UAV BPI program, currently in a risk mitigation phase, offers great potential as a cost-effective BPI system. This defense option may be pursued if an advanced threat rapidly emerges and/or the ABL solution requires augmentation.

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